Afzelia africana

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Afzelia africana

Taxonomy and nomenclature

Family: Leguminoseae
Synonyms: Intsia africana (Smith ex Pers.) Kuntze.
Vernacular/common names: The English name is the African oak. The Dioula (West Africa) name for the timber is 'Lingué', and the tree is called 'Kankalga' in Moré and 'Lingahi' in Fulfulde (Burkina Faso).

Distribution and habitat

Afzelia africana is one of the most widely distributed species in Africa. It is found from Senegal in West Africa to the Sudan, Uganda and Tanzania in the east. It is also present in South Asia, e.g. in India. It is occasionally grown in other tropical countries as an ornamental. The tree grows between 1100 and 1400 masl., in moist areas with over 700 mm of annual rainfall. Its habitat is various semi-humid savannahs, fringing forests, Guinean forests and wooded grassland on deep sandy and alluvial soils. Seedlings are sensitive to fire, browsing and drought, and therefore need to be protected from these factors until they are fully established. *A. africana* is known to have a mutualistic symbiosis with at least 37 ectomycorrhizal fungi species. Although it is a widespread species it has declined in population numbers. In 1998 it was re-assessed and re-classified as »Vulnerable« on the IUCN red list of species due to the threat of over-exploitation for timber on the international market.

Uses

The species produces high quality timber, which is termite resistant but somewhat difficult to work. The wood is used for construction, furniture, cooking utensils, canoes and African drums ('djembe'), and also for firewood and charcoal. The foliage contains proteins and provides nutrition to animals. The bark is used as poison for fishing, and the pods as musical instruments. The plant is used in local medicine for general pain relief, digestive problems, e.g. constipation and vomiting and for internal bleedings (haemorrhagic). *A. africana* seeds are being investigated for their usefulness in providing seed flour and seed oil.

Botanical description

The species can grow into a large tree, up to 25-30 m in height. It has a spreading and open crown with large branches. The bark is dark grey, fissured and layered, and peals off to reveal pale grey patches with granular, pink to brown slash. The stems have cork pores. The leaves are alternate, paripinnate and up to 30 cm long. There are 3-8 pairs of shiny dark green leaflets widely spaced on the rachis. They are broadly elliptic, 5-15 cm in length and 3.5-8.5 cm wide, acuminate or obtuse to rounded at the apex. The inflorescence is a 5-15 cm long much branched panicle.

The fragrant white flowers often have purple markings. The flowers are composed of 3 elliptic upper petals, 10-12 mm long and 1 lower petal with two divergent round lobes.

A longitudinal cut of *A. africana* pod with seed (material provided by CNSF, image taken by W. Stuppy).

Fruit and seed description

Fruit: The fruit is a flattened, straight woody pod, 10-18 cm long, 6-8 cm wide and 2-5 cm thick. Each pod contains c. 7-10 seeds.
Seed: The seeds are black, smooth, ellipsoid or oblong-ellipsoid and more or less shiny. The seeds have an orange funicular aril at the base, which covers a quarter to a third of the seed. The seeds are 1.6-3 cm long and 1.1-2.1 cm wide, and have a mean thousand seed weight of c. 2500 g. The embryo is yellowish-white in colour. The ovule orientation is anatropous. The seeds contain about 27% crude proteins, 33% crude carbohydrates and 18% of the seed dry weight is oil.

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Flowering and fruiting habit

In West Africa, flowering occurs during the rainy season and fruits mature in December/January onward.

Harvesting

Pods are collected from the tree when the pods turn mature colour but before dehiscence. Harvesting time is generally not critical as the pods may remain on the tree for 6-7 months.

Processing and handling

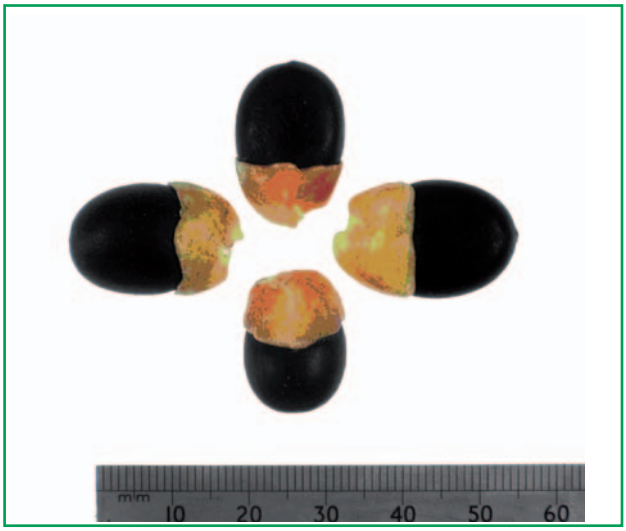
Seeds can be removed from the pod when it splits open upon drying. The aril should be removed, e.g. by rubbing or washing which is easiest when the seeds are still moist. If it is hard and dry removal is eased by soaking in water.

Storage and viability

The seeds exhibit 'orthodox' storage behaviour. At moisture contents (MC) of c. 8% seeds can be stored at ambient conditions for at least 33 months, without significant decrease in viability. For short term storage the seeds can be stored with moist vermiculite or sawdust at c. 25°C, ventilating frequently to ensure aerobic conditions. Seeds of this species have been stored under cold conditions at the MSB since 1984.

Sowing and germination

The seeds vary in their sizes, and while smaller seeds tend to germinate more rapidly, the seedlings from larger seeds have higher relative growth rates. In germination experiments conducted at MSBP it was found that seeds that have been chipped required 8 days to initiate germination and 100% germination was achieved by day 14 at 25ºC. The seeds germinated even when the outer seed coat was completely covered with fungi. The seeds did not germinate at 10ºC, whilst germination occurred by day 11 at 20ºC and by day 7 at 30ºC. The optimum temperature for germination was 25ºC, with incubated seeds having less fungi, and maximum germination was reached within two weeks at both 25ºC and 30ºC.



Clean seeds of *A. africana.* Photo: H. Vautier

Selected readings

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